

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. **(Currently Amended)** A process Process for the purification of acrylic acid obtained by catalytic or redox oxidation of a the propylene and/or acrolein gas substrate by the catalytic route or by the redox route, the said a gas mixture (1) resulting from the said oxidation comprising reaction being composed mainly of propylene, when the substrate comprises propylene, ultimate oxidation products, acrylic acid, acrolein, steam, acetic acid and heavy products from side reactions,

wherein: characterized in that:

- the reaction gas mixture (1) is sent to the bottom of an absorption column (C1), which column is fed countercurrentwise at the top with at least one heavy hydrophobic absorption solvent, in order to obtain:
- at the top of the said column (C1), a gas flow (7) composed of propylene and the ultimate oxidation products of the mixture (1), major amounts of water and of acetic acid, and acrolein; and
- at the bottom of the said column (C1), a flow (4) composed of acrylic acid, the heavy absorption solvent, or solvents, the heavy products from side reactions, and minor amounts of acetic acid and of water;
- the gas flow from the top (7) of the said absorption column (C1) is sent to a heat exchanger (C3), where it is brought into intimate contact with a descending liquid stream (8), fed at the top of the said heat exchanger (C3), comprising a previously cooled composed of the recycling of a portion of the flow (9), cooled beforehand, recycled from the bottom of the heat exchanger (C3), in order to obtain, at the top of the heat exchanger (C3), a gas flow (10) comprising the compounds present in gas the feed flow (7) to of the said heat exchanger (C3), in which except for most of the water and all the acetic acid, which are removed in the flow (9) from the bottom of the heat exchanger (C3),
- the flow (10) is at least partially recycled to the reaction stage.

2. **(Currently Amended)**

A process Process according to Claim 1,

which at least characterized in that use is made of one or more heavy hydrophobic absorption solvent solvents having a boiling point at atmospheric pressure of greater than 200°C is used.

3. **(Currently Amended)**

The process Process according to Claim 2, wherein

the characterized in that use is made, as heavy hydrophobic absorption solvent, of is at least one nonhydrolysable hydrophobic aromatic compound having:

- a boiling point at atmospheric pressure of between 260°C and 380°C;
- a crystallization temperature of less than 35°C; and
- a viscosity of less than 10 mPa.s in a temperature range of 38-80°C.

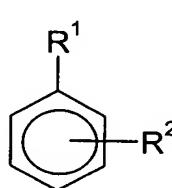
4. **(Currently Amended)**

A process Process according to Claim 3,

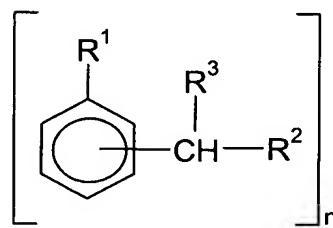
characterized in that the choice is made of wherein the hydroponic absorption solvent is a hydrophobic aromatic compound having a boiling point of between 270°C and 320°C.

5. **(Previously Presented)** A process according to Claim 3, said hydrophobic aromatic compound having a crystallization temperature of less than 0°C.

6. **(Previously Presented)** A process according to Claim 3, wherein the hydrophobic aromatic compound or compounds is/are represented by the general formulae (I) or (II):



(I)



(II)

or those represented by the general formula (III):



in which:

- R⁷ represents hydrogen or C₁-C₄ alkyl; and
- R⁸ represents C₁-C₄ alkyl.

7. **(Previously Presented)** A process according to Claim 1, characterized in that the absorption column (C1) is fed with one or more pure solvents and/or with one or more solvents originating from a recycling of one or more flows obtained in subsequent purification stages.

8. **(Previously Presented)** A process according to Claim 1, wherein the absorption column (C1) comprises:

- in its lower part, at least one cooling zone (S1) and recirculating, through an external exchanger (E1), a portion (3) of a flow (4) collected in the lower part of the said section or sections (S1), in order to return it to the top of the said section or sections; and
- in its upper part, a zone (S2) comprising absorbing and rectifying the gas mixture (1).

9. **(Previously Presented)** A process according to Claim 1, wherein the absorption is carried out in the column (C1) at atmospheric pressure or at a pressure close to

atmospheric pressure and at a temperature for introducing the solvent or solvents of 20 to 100°C.

10. (Previously Presented) A process according to Claim 1, wherein the absorption is carried out in the column (C1) in the presence of at least one polymerization inhibitor.

11. (Currently Amended) A process Process according to Claim 10, wherein characterized in that the inhibitor or inhibitors are chosen from phenol derivatives, such as hydroquinone and its derivatives, for example hydroquinone methyl ether, phenothiazine and its derivatives, such as methylene blue, quinones, such as benzoquinone, metal thiocarbamates, such as copper dibutyldithiocarbamate, compounds comprising nitroso groups, such as N-nitroso-phenylhydroxylamine, and amines, such as para-phenylenediamine derivatives.

12. (Previously Presented) A process according to Claim 1, a flow (4) resulting from the column (C1) is sent to a distillation column (C2), in which column distillation is carried out, in order to obtain:

- at the top, a flow (5) composed of the light impurities, which is returned to the lower part of the absorption column (C1); and
- at the bottom, a flow (6) composed of acrylic acid in solution in the absorption solvent or solvents, a low proportion of acetic acid, the heavy products from side reactions, and the polymerization inhibitor or inhibitors.

13. (Currently Amended) A process Process according to Claim 12, wherein characterized in that the distillation is carried out in the column (C2) at a pressure of 2.66×10^3 Pa to 3.33×10^4 Pa, at a top temperature of 40-90°C and at a bottom temperature of 60-150°C.

14. (Previously Presented) A process according to Claim 1, wherein the heat exchanger (C3) is a direct contact condenser or a partial condensation column.

15. (Cancelled)

16. (Previously Presented) A process according to Claim 1, wherein the heat exchange in the heat exchanger (C3) is conducted at atmospheric pressure or at a pressure close to atmospheric pressure and at a top temperature of 30-90°C, the percentage of removal of the water on the heat exchanger (C3) being from 20 to 80% by weight.